

Name: Answer Key

Teacher: _____

Algebra Pd: _____

Unit One Practice Test

Day Month Year

1. Algebraic Writing: Answer each question in complete sentences using algebraic terms. Be sure to echo the prompt.

a. A peer tells you that to graph the line: $y = -\frac{3}{4}x - 1$, you first place a point at negative one on the y-axis, then rise three and run four to the right to find your second point. Write your response to your peer where you agree or disagree with him/her AND explain why. Be as specific as possible.

I agree with my peer regarding the y-intercept.
However, I disagree with the second point.
Because the slope is negative, my peer should fall three, then run four to the right.

b. Define relation and function and explain the relationship between the two.

A relation is a set of ordered pairs. A function is a relation in which each input has one and only one output. All functions are relations, but not all relations are functions.

c. What does algebra mean in Arabic? Explain how this definition makes sense.

Algebra in Arabic means the reunion of broken parts. (various explanations → combining like terms, reuniting variables with the values they represent, etc.)

2. Function? Circle YES or NO, then explain your choice using complete sentences and algebraic terms.

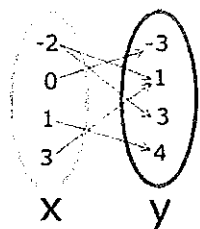
a) $\{(-3,4), (2,5), (3,5), (-1,3)\}$

☒ YES

☐ NO

Each input has only one output.

b)

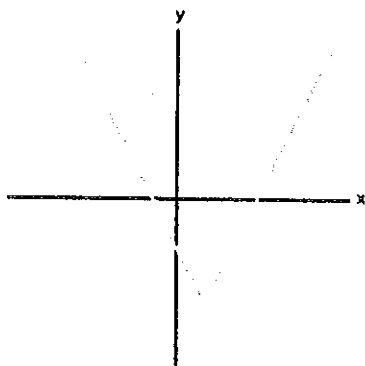


☐ YES

☒ NO

The input of -2 has more than one output.

c)



☒ YES

☐ NO

This function passes the vertical line test.

3. Function Notation: Given $f(x) = -2x - 3$, fill in the table and answer the question in part b.

a)

x	-1	0	1	-3	-4
f(x)	-1	-3	-5	3	5

$$\begin{aligned} 3 &= -2x - 3 \\ 6 &= -2x \\ 5 &= -2x - 3 \\ 8 &= -2x \end{aligned}$$

$$f(-1) = -2(-1) - 3 = 2 - 3 = -1 \quad f(1) = -2(1) - 3 = -2 - 3 = -5$$

b) Display the information from the table as a set of ordered pairs.

$$\{(-1, -1), (0, -3), (1, -5), (-3, 3), (-4, 5)\}$$

4. Open-Ended: For each part, create your own example of the situation.

a. an equation in standard form with a slope of $\frac{3}{4}$ $3x - 4y = 8$

b. an equation of a line with an undefined slope $x = 2$ (constant can vary)

c. a set of ordered pairs that IS NOT a function

$$\{(6, -3), (6, 2), (1, 6), (3, 8)\}$$

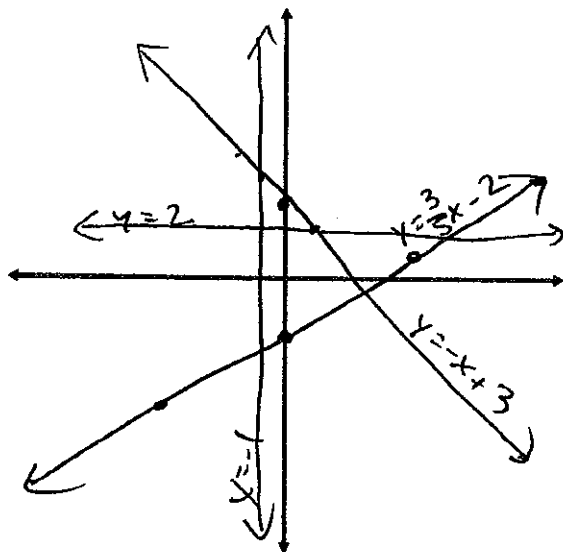
5. Graphing Lines: Graph each line on the coordinate plane. Extend and properly NAME your lines and use a straight edge.

a. $y = \frac{3}{5}x - 2$

b. $y = -x + 3$

c. $y = 2$

d. $x = -1$

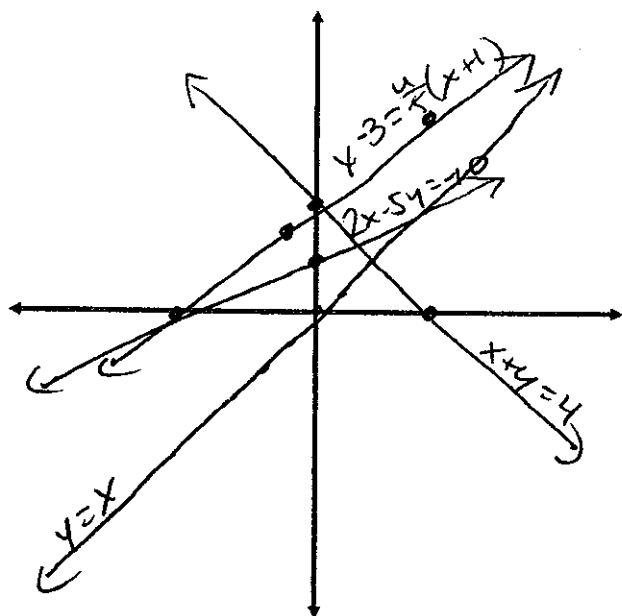


e. $2x - 5y = -10$

f. $x + y = 4$

g. $y = x$

h. $y - 3 = \frac{4}{5}(x + 1)$



6. Knowledge of Algebraic Terms

a. Write the slope formula.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

b. Write the general slope-intercept form of a linear equation.

$$y = mx + b$$

c. Rate of change is equal to the change in the dependent quantity over the change in the independent quantity.

7. Slope: Find the slope of the line between the given points. Write your answer as a reduced fraction, if possible.

a. $(-3, 7)$ and $(4, 5)$

$$\frac{5-7}{4+3} = \boxed{\frac{-2}{7}}$$

b. $(6, -1)$ and $(6, 4)$

$$\frac{4+1}{6-6} = \boxed{\text{undefined}}$$

c. $(-7, 1)$ and $(-7, -1)$

$$\frac{-1-1}{-7+7} = \frac{-2}{0} = \boxed{\text{undef}}$$

8. Rate of Change: Find the rate of change for each situation. Be sure to include labels.

a. In his second week of saving money, Niko has \$260 in his bank account. After eight weeks of saving money, Niko has \$620 in his bank account.

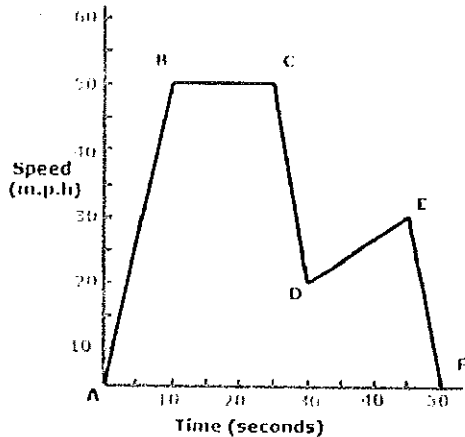
$$\frac{620 - 260}{8 - 2} = \frac{360}{6} = \boxed{\$60/\text{week}}$$

b. A velociraptor hatches and is 5 inches long. On his six month birthday, the velociraptor is 1 foot, 2 inches long.

1 ft, 2 in \rightarrow 14 in month

$$\frac{14 - 5}{6 - 0} = \frac{9}{6} = \boxed{3 \text{ in per month}}$$

c. Use the graph below to determine rate of change between thirty seconds and forty-five seconds.



$$\frac{30 - 20}{45 - 30} = \frac{10}{15} = 10 \text{ mph} / 15 \text{ sec}$$

$$= \boxed{2 \text{ mph per 3 sec}}$$

9. Writing Equations of Lines

a. Write the equation of the line in slope-intercept form that passes through the points (9, -8) and (10, 6).

$$m = \frac{6 - (-8)}{10 - 9} = \frac{14}{1} = \boxed{m = 14}$$

$$\boxed{y = 14x - 134}$$

$$y = mx + b$$

$$-8 = 14(9) + b$$

$$-8 = 126 + b$$

$$-126 - 126$$

$$\boxed{-134 = b}$$

$$b = 14(10) + b$$

$$6 = 140 + b$$

$$-140 - 140$$

$$\boxed{-134 = b \checkmark}$$

b. Write the equation of the line parallel to $y = 9x + 1$ that passes through $(-\frac{1}{9}, -3)$.

$$m = 9$$

$$\boxed{y + 3 = 9(x - \frac{1}{9})} \text{ OR}$$

in f-s form

$$\boxed{y = 9x - 2}$$

$$-3 = 9(-\frac{1}{9}) + b$$

$$-3 = -1 + b$$

$$\boxed{-2 = b}$$

c. Write the equation of the line perpendicular to $x + 2y = -9$ that passes through $(6, -5)$.

$$m = -\frac{1}{2} \quad \text{slope of } \perp \text{ line} = 2$$

$$-5 = 2(6) + b$$

$$-5 = 12 + b$$

$$-17 = b$$

$$y = 2x - 17 \quad \text{OR} \quad y + 5 = 2(x - 6)$$

c. Write the equation of the line in point-slope form that passes through $(30, -2)$ and $(12, -11)$.

$$m = \frac{-11 + 2}{12 - 30} = \frac{-9}{-18} = \frac{1}{2}$$

$$y + 2 = \frac{1}{2}(x - 30)$$

OR

$$y + 11 = \frac{1}{2}(x - 12)$$

d. Write the equation of the line in proper standard form: $y = 0.08x - 3.6$.

$$-100(-0.08x + y = -3.6)$$

$$8x - 100y = 360 \quad \text{OR} \quad 2x - 25y = 90$$

10. Real World Situation #1: Your plumber charges you a flat rate of \$100 per visit, plus an additional \$50 per super-gross clog.

a. Define two variables that make sense for the situation. Use the word LET.

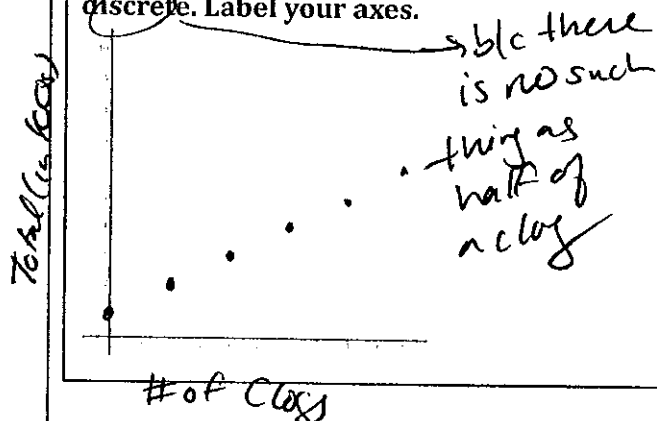
Let t = total cost

Let c = # of clogs

b. Write an equation in slope-intercept form to represent this situation.

$$t = 50c + 100$$

c. Graph this situation on the first quadrant of the coordinate plane. **Be sure to consider whether this data is continuous or discrete.** Label your axes.



d. Using either your graph or the equation, find the total amount of money you would pay your plumber if you had 6 super-gross clogs.

$$\begin{aligned} t &= 50(6) + 100 \\ &= 300 + 100 \\ &= \$400 \end{aligned}$$

11. Real World Situation #2: Fiona is selling soccer balls and soccer cleats. The soccer balls cost \$20 each and the cleats cost \$50 for each pair. She wants to make at least \$500 selling the equipment.

a. Define two variables that make sense for the situation. Use the word LET.

let b = # of soccer balls
let c = # of cleats

b. Write an equation in standard form to represent this situation.

$$20b + 50c = 500 \quad \text{or} \quad 20b + 50c \geq 500$$

c. If Fiona sells five soccer balls, how many pairs of cleats will she have to sell in order to make \$500?

$$20(5) + 50c = 500$$

$$100 + 50c = 500$$

$$50c = 400$$

$$c = 8 \text{ prs of cleats}$$

12. Multiple Choice: Write the CAPITAL LETTER of the best answer in the space provided.

a. D The slope of $2x - 5y = 8$ is:

A. 2 B. -5 C. $-\frac{2}{5}$ D. $\frac{2}{5}$

$$-\frac{A}{B} = -\frac{2}{-5} = \frac{2}{5}$$

b. F After two hours of driving, a motorcyclist is one hundred miles away from his starting point. After five hours of driving, the motorcyclist is two hundred eighty hundred miles away from his starting point. What is his rate of change between two and five hours?

E. 280 miles per hour F. 60 miles per hour
G. 50 miles per hour H. 93.3 miles per hour

$$\frac{280 - 100}{5 - 2}$$

$$= \frac{180}{3}$$

$$= 60$$

c. A One point on the line $y - 2 = 5(x + 3)$ is:

A. (-3, 2) B. (2, -3) C. (3, -2) D. (-2, 3)

d. G Which of the following is in proper standard form?

E. $7y - 3x = 21$ F. $-3x + 7y = 21$
G. $3x - 7y = 21$ H. $\frac{3}{7}x + y = 21$